AMENDMENTS TO THE CLAIMS

Pursuant to 37 C.F.R. § 1.121 the following claim will replace all prior versions of the claim in the application.

1-2. (Cancelled)

3. (Currently Amended) The image processing method of Claim [[2]] 6, further comprising the step of:

compressing each evaluation vector that has been subjected to orthogonal transformation so as to reduce a processing amount.

4. (Currently Amended) The image processing method of Claim [[2]] 6, wherein for said template image, the steps taken until said evaluation vector that has been subjected to orthogonal transformation is compressed are executed before said input image is input, and storing results thereof.

5. (Currently Amended) The image processing method of Claim [[2]] 6, further comprising the step of:

normalizing said evaluation vector with respect to a vector length.

6. (Currently Amended) ~~The~~ An image processing method ~~of Claim 2, further~~ comprising the steps of:

inputting a specified image for a template image;

inputting a specified image for an input image;

calculating an edge normal direction vector of said specified image;

generating an evaluation vector from said edge normal direction vector;

normalizing said evaluation vector of said template image by the number of edge normal direction vectors;

subjecting said evaluation vector to orthogonal transformation;

performing a product sum calculation of corresponding spectral data for each evaluation vector that has been subjected to orthogonal transformation;

subjecting a result of said product sum calculation to inverse orthogonal transformation and generating a map of similarity values; and

a formula of said similarity values, said orthogonal transformation, and said inverse orthogonal transformation each have linearity.

7. (Currently Amended) The image processing method of Claim [[2]] 6, further comprising the steps of:

reducing a data amount using complex conjugate properties of orthogonal transformation before performing a product sum calculation; and

restoring said data amount after performing said product sum calculation.

8. (Currently Amended) ~~The~~ An image processing method ~~of Claim 2, further~~ comprising the steps of:

inputting a specified image for a template image;

inputting a specified image for an input image;

enlarging/reducing said template image to various sizes; ~~and~~

calculating an edge normal direction vector of said specified image;

generating an evaluation vector from said edge normal direction vector;

subjecting said evaluation vector to orthogonal transformation;

subjecting said evaluation vector of each size to addition processing;

performing a product sum calculation of corresponding spectral data for each evaluation vector that has been subjected to orthogonal transformation;

subjecting a result of said product sum calculation to inverse orthogonal transformation and generating a map of similarity values; and

a formula of said similarity values, said orthogonal transformation, and said inverse orthogonal transformation each have linearity.

9. (Original) The image processing method of Claim 8, wherein, for said template image, said addition processing of said evaluation vector is carried out after executing said step of compressing each evaluation vector so as to reduce the processing amount.

10. (Currently Amended) The image processing method of Claim [[2]] 6, wherein said template image is an image of a typified face.

11. (Currently Amended) The image processing method of Claim [[2]] 6, further comprising the steps of:

preparing a peak pattern that makes a peak of said similarity value steep; and

subjecting data of said peak pattern to orthogonal transformation to said product sum calculation.

12. (Currently Amended) The image processing method of Claim [[2]] 6, further comprising the steps of:

forming a mask pattern that depends on said template image; and

subjecting data of this mask pattern to orthogonal transformation to said product sum calculation.

13. (Original) The image processing method of Claim 12, wherein said mask pattern includes an average of a number of pixels in an image of said template image.

14. (Currently Amended) The image processing method of Claim [[2]] 6, further comprising the steps of:

for said template image, processing positive and negative signs of said evaluation vector of said original template image; and

generating an evaluation vector of a bilaterally symmetrical image with respect to said original template image, by which said generated evaluation vector is applied to said product sum calculation.

15. (Currently Amended) The image processing method of Claim 10, further comprising the steps of:

generating a map of point biserial correlation coefficients on the basis of an extracted face image; and

responsive to said correlation coefficients, calculating a position of said face part.

16. (Currently Amended) The image processing method of Claim 10, further comprising the steps of:

calculating a distribution of projection values in a y-direction on the basis of said extracted face image by use of said mask pattern;

calculating two maximum points from said distribution; and

outputting a range between said two maximum points as a mouth range.

17. (Currently Amended) The image processing method of Claim 10, further comprising the steps of:

dividing said input image into only said face image and parts other than said face image on the basis of said extracted face image;

embedding a digital watermark only into said face image;

combining said face image into which said digital watermark has been embedded with parts other than said face image to produce a combined result; and

outputting said combined result.

18. (Currently Amended) The image processing method of Claim 10, further comprising the steps of:

dividing said input image into only said face image and parts other than said face image on the basis of said extracted face image;

editing only said face image;

combining said face image after editing with parts other than said face image to produce a combined result; are

outputting said combined result.

19. (Cancelled)

20. (Currently Amended) The image processing apparatus of Claim [[19]] 22, wherein said template image processing part includes a recording unit operable to record said evaluation vector that has been compressed to reduce a processing amount and that has been subjected to orthogonal transformation, and a result obtained by compressing said evaluation vector that has been subjected to orthogonal transformation is stored in said recording unit before inputting said input image.

21. (Currently Amended) The image processing apparatus of Claim [[19]] 22, further comprising:

a conjugate compression unit between said recording unit and said multiplication unit;

said conjugate compression unit operable to reduce the data amount using complex conjugate properties of orthogonal transformation;

a conjugate restoring unit between said multiplication unit and said inverse orthogonal transformation unit; said conjugate restoring unit operable to restore the data amount reduced by use of the complex conjugate properties of orthogonal transformation.

22. (Currently Amended) ~~The~~ An image processing apparatus ~~of Claim 19, further~~ comprising:

a template image processing part operable to input a template image and calculate an edge normal direction vector of said template image, normalize said edge normal direction vector of said template image, generate an evaluation vector from said normalized edge normal direction vector, subject said evaluation vector to orthogonal transformation, and compress said evaluation vector that has been subjected to said orthogonal transformation so as to reduce the processing amount;

an input image processing part operable to input an input image and calculate an edge normal direction vector of said input image, generate an evaluation vector from said edge normal direction vector, subject said evaluation vector to orthogonal transformation, and compress said evaluation vector that has been subjected to said orthogonal transformation so as to reduce the processing amount;

an enlargement/reduction unit operable to enlarge or reduce said template image to various sizes; ~~and~~

a multiplication unit operable to perform a product sum calculation of corresponding spectral data about each evaluation vector that has been subjected to said orthogonal transformation and has been obtained for said template image and said input image;

an addition unit operable to perform addition processing of said evaluation vector of each size; and

an inverse orthogonal transformation unit operable to subject a result of said product sum calculation to inverse orthogonal transformation and further operable to generate a map of similarity values;

said evaluation vector including a component in which an edge normal direction vector of a specified image undergoes even-numbered times angular transformation, and a formula of said similarity values, said orthogonal transformation, and said inverse orthogonal transformation each have linearity.

23. (Previously Presented) The image processing apparatus of Claim 22, wherein said addition unit is further operable to perform addition processing of said evaluation vector of said template image after compressing said vector so as to reduce the processing amount.

24. (Currently Amended) The image processing apparatus of Claim [[19]] 22, further comprising a peak pattern processing unit operable to subject a peak pattern by which a peak of a similarity value is made steep to orthogonal transformation and compress said peak pattern that has been subjected to said orthogonal transformation so as to reduce the processing amount,

wherein a result obtained by subjecting data of this peak pattern to said orthogonal transformation is applied to a product sum calculation of said multiplication unit.

25. (Currently Amended) The image processing apparatus of Claim [[19]] 22, further comprising:

a mask pattern processing part operable to form a mask pattern that depends on said template image and generate data obtained by subjecting data of this mask pattern to orthogonal transformation and by compressing it, wherein a processing result of said mask pattern processing part is applied to a product sum calculation of said multiplication unit.

26. (Original) The image processing apparatus of Claim 25, wherein said mask pattern includes a mean of a number of pixels inside an image of said template image.

27. (Currently Amended) The image processing apparatus of Claim [[19]] 22, further comprising:

a symmetric vector generation unit operable to process positive and negative signs of said evaluation vector of an original template image recorded in said recording unit, and further operable to generate an evaluation vector of a bilaterally symmetric image with respect to said original template image, wherein said evaluation vector generated by said symmetric vector generation unit is applied to a product sum calculation of said multiplication unit.

28. (Currently Amended) The image processing apparatus of [[19]] 22, further comprising a map forming unit operable to form a map of a point biserial correlation coefficient on the basis of an extracted face image, and an extraction unit operable to calculate a position of a face part from the formed map.

29. (Currently Amended) The image processing apparatus of [[19]] 22, further comprising a maximum point extraction unit operable to calculate a projection value distribution in a y direction by use of a mask pattern on the basis of an extracted face image, and further operable to calculate two maximum points from this distribution, and outputting a range between said maximum points such as a mouth range.

30. (Currently Amended) The image processing apparatus of [[19]] 22, further comprising:

a face image cutting-out unit operable to separate an input image into only a face image and parts excluding said face image on the basis of an extracted face image;

a digital watermark embedding unit operable to embed a digital watermark only into the face image; and

an image synthesizing unit operable to combine said face image into which said digital watermark has been embedded with parts excluding said face image and outputting the combined data.

31. (Currently Amended) The image processing apparatus of [[19]] 22, further comprising:

a face image cutting-out unit operable to separate an input image into only a face image and parts excluding said face image on the basis of an extracted face image;

an image correction unit operable to edit only said face image; and

an image synthesizing unit operable to combine an edited face image with parts excluding said face image and outputting them.

32. (Original) The image processing method of Claim 10, further comprising:

cutting out a face image from said input image on the basis of an extracted face image;

extracting a facial inner image from said face image that has been cut out;

calculating a feature that correct said face image on the basis of said extracted face image;

determining a correction function on said basis of said obtained feature; and

applying image correction based on said determined correction function at least onto said face image that has been cut out.

33. (Original) The image processing method of Claim 32, wherein said feature is a combination of at least two of brightness, chroma average, and hue average.

34. (Currently Amended) The image processing apparatus of [[19]] 22, further comprising:

a face image cutting-out unit operable to cut out a face image from said input image on a basis of an extracted face image;

a face internal range extraction unit operable to extract a facial inner image from said face image that has been cut out;

a image feature extraction ~~means for calculating~~ unit operable to calculate a feature that serves to correct said face image on a basis of said extracted face image;

a correction function determining unit operable to determine a correction function on a basis of said obtained feature; and

a image correction unit operable to apply image correction based on said determined correction function at least onto said face image that has been cut out.

35. (Original) The image processing apparatus of Claim 34, wherein said feature is a combination of at least two of brightness, chroma average, and hue average.